

WHAT IS CLAIMED IS:

1. A method of using an adhesion precursor in an integrated circuit fabrication process, the method comprising:
providing a gas of material over a dielectric material to form an adhesion precursor layer, the dielectric material including an aperture;
5 and
providing a copper layer over the adhesion precursor layer.
2. The method of claim 1, the adhesion precursor layer includes a barrier material.
3. The method of claim 1, wherein the adhesion precursor layer
10 has a thickness of 10-100 Angstroms.
4. The method of claim 1, further comprising providing a second gas of a second material over the adhesion precursor layer.
5. The method of claim 4, wherein the second gas includes tin (Sn), indium (Sn), zinc (Zn), or chromium (Cr.).
- 15 6. The method of claim 4, further comprising providing a third gas of a third material over a layer formed by the second gas.
7. The method of claim 6, wherein the third gas includes an alloying element.
8. The method of claim 1, further comprising providing a gas
20 including an alloying agent over the adhesion precursor layer.
9. The method of claim 1, wherein the adhesion precursor layer includes a ternary element of Iridium, Ruthenium, or Rhenium.

10. A method of improving adhesion between a copper layer and a dielectric layer by providing an adhesion precursor, the method comprising:

- forming a trench in a dielectric layer;
- 5 providing an adhesion precursor gas above the dielectric layer and the trench to form an adhesion precursor layer;
- providing an alloy layer above the adhesion precursor layer;
- and
- providing a copper layer above the alloy layer.

10 11. The method of claim 10, wherein the adhesion precursor layer has a thickness of 10-100 Angstroms.

12. The method of claim 10, further comprising providing a blending layer over the adhesion precursor layer, wherein the blending layer includes an alloying material.

15 13. The method of claim 10, wherein the adhesion precursor layer includes a ternary element, the ternary element being selected from a group consisting of Iridium (Ir), Ruthenium (Ru), and Rhenium (Re).

14. The method of claim 10, wherein the alloy layer has a thickness of up to 50 Angstroms.

20 15. A method of using an adhesion precursor for chemical vapor deposition, the method comprising:

- forming a trench in a dielectric layer;
- forming a continuous barrier layer above the dielectric layer and along sides of the trench;
- 25 depositing copper above the continuous barrier layer, the copper located in the trench forming an integrated circuit feature.

16. The method of claim 15, wherein the continuous barrier layer is formed from a gas having a ternary element.

17. The method of claim 15, further comprising providing a chemical mechanical polish to level the copper to substantially the same
5 level as the continuous barrier layer above the dielectric layer.

18. The method of claim 15, wherein the continuous barrier layer has a cross-sectional thickness of 10-100 Angstroms.

19. The method of claim 15, wherein the feature is a via.

20. The method of claim 15, wherein the continuous barrier layer
10 includes a material selected from a group consisting of Iridium (Ir), Ruthenium (Ru), and Rhenium (Re).